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Natural Gas
a political weapon for the Soviet Union?

*by B. Fritz**

The great fear supposedly inspired by the approach of the year 1000 was no more than a tall story invented afterwards by a few historians casting about for something to say. Present fears about the year 2000, on the other hand, are infinitely more realistic, concerning as they do the possible shortage of primary energy.

In France, for example, where some pioneering work has been done in the energy field, too long neglected by the world as a whole, the turn of the century will coincide more or less with the approaching exhaustion of the historic natural-gas deposit at Lacq. There are countries, though, which have a much brighter future. One example is the USSR, where the Kremlin clearly has good reasons for its stated intention of aligning its energy policy to take better advantage of the country's natural-gas resources. Intense prospecting in Siberia, the professed Soviet desire to increase natural-gas production and the gigantic project for a 5,500km-long gas pipeline running from the Yamal peninsula to western Europe are all indicative of the importance the USSR attaches to its natural gas. As the Nairobi Conference last August showed, the future of renewable "alternative" energies is far from being as clear-cut as it might (a situation openly encouraged by both the United States and the USSR), while at the same time many of the oil-producing countries are far from stable. So the Soviet Union clearly holds a trump card in her hand. Although the significance of Russia's natural gas will only really make itself felt from 1985-1990 onwards, it might well be advisable for the West to take note of the situation straight away. At all events, last November's signing by the German company Ruhrgas (with the backing of Gaz de France) of an important contract for the supply of Siberian gas (40 to 50 billion m^3 per annum) has initiated a process which appears irreversible. And it seems likely that France, Switzerland, Italy, the Netherlands and Austria will follow suit, in spite of the efforts of President Carter and his successor Ronald Reagan at the Ottawa summit to prevent an agreement which they saw as something akin to the "finlandization" of Europe.

Western observers have been surprised by the fact that for almost twenty years now the USSR — normally very reticent with this sort of information — has been publishing precise details about her reserves of natural gas and their geographical distribution. The main purpose of this publicity appears to have been to encourage the Soviet people to make use of this new source of energy, at least for domestic purposes (natural gas has no direct military applications). But it was also equally desirable for any foreign countries which might have an interest to be aware of the Soviet Union's substantial resources.

Europe and the market for natural gas

The market for natural gas in Europe has not yet experienced the sort of economic upheaval undergone by the oil trade following the drastic price hikes of 1973. But this does not mean that the future is assured. Although the North Sea may still come up with some pleasant surprises (according to some estimates, recoverable reserves could be as high as 1,200 billion m^3), most of the fields now being exploited have already achieved their peak production level. Since the Islamic revolution in Iran, this country's production has been highly problematical. Yet Iran is sitting on 15-20% of the world's reserves — supplies which, for the time being, are frozen. The existence of the Iranian natural-gas pipeline does mean, however, that exports could be restarted relatively easily — to the USSR.

The deposits in Algeria, interesting amongst other things because of the country's proximity to the industrialised nations of western Europe, are also bedevilled by the unpredictability of the Algerian government's policies. For instance, Algeria has just told her European partners that the natural-gas liquefaction plants envisaged in the current five-year plan (1980-1984) will not be constructed after all. Although the French firm Sonatrach (a subsidiary of Compagnie Française des Pétroles) is at present negotiating with the Algerian government to obtain additional supplies by gas pipeline, initial results have hardly been encouraging. The bitter facts

*The author would like to thank the technical departments of the IFP, Technip, Gaz de France and the Comité Professionel du Pétrole for their valuable advice in the preparation of this article.

were made plain some weeks ago during the French president M. Mitterrand's visit to Algiers, when France was obliged to pay a high price for Algerian gas in return for guaranteed supplies (reportedly 9 billion m³ per year).

Nigeria's potential production of 20 billion m³ per year is quite simply being burnt away in the form of flares — which is no isolated phenomenon. Were this country to consider marketing its product sometime around 1985, the proportion going to Europe would probably not exceed 8 billion m³. As for Qatar and Cameroon, negotiations here are still at the talking stage. A certain amount of anxiety is bound to be aroused by the Soviet Union's potential hegemony in a market about which the only thing known for certain is that it will grow — and grow rapidly. West Germany's position in this connection is significant: of the 40-50 billion m³ per year which western Europe should be receiving from Siberia from 1985 onwards, Bonn hopes to get over 10 billion m³. The German opposition is therefore quite justified in evoking the spectre of economic pressure being applied in the political arena in an attempt to "neutralize" the Federal German Republic. However, the structure of the future market for natural gas will call for enormous investments, and this necessity will largely rule out the likelihood of continuous and uneconomical fluctuations on the part of either the suppliers or the consumers, each side finding its interests closely interwoven with those of the other.

The role of the USSR in the natural-gas market

As demonstrated quite clearly by the 11th World Energy Conference, natural gas has become one of the essential sources of primary energy. For example, it accounts for 16-18% of the primary energy used by Common Market countries, and its contribution is likely to go on growing well beyond the year 2000. Its political significance is therefore acquiring very notable dimensions.

The current instability in Iran and, to a lesser degree, in Iraq and Afghanistan means that Middle East reserves have for the time being lost their importance, so the Soviets look like becoming the world leaders in the production — and therefore the export — of natural gas.

Reserves

Within the 22 million square kilometres of Soviet territory, characterized as it is by vast regions of sedimentary origin, over 10 million square kilometres may be of interest to the oil industry. These figures reveal sufficiently clearly both the size of the task involved and the immensity of the prospects. In 1860, Baku became the first centre of exploitation for both oil and gas. Since then, the Ukraine and the Orenburg region have developed into zones of large-scale production. The deposits between the Volga and the Urals provide the major part of Soviet gas, most of it contained in the sandstone of the Devonian period and the limestone of the Carboniferous / Permian periods. The northern part of these deposits offers interesting prospects between depths of 250 and 1,200m. The Apsheron peninsula and the southern end of western Turkmenistan have also produced results at 350m and below. But the world's biggest reserves of natural gas are almost certainly in Arctic Siberia (Cenomanian sands of the lower Ob). These deposits, which probably extend out under the Arctic Ocean, are fairly near the surface (approximately 1,500m down) and do not contain any heavy oil fractions.

Systematic prospecting appears to have started in 1965, when, despite all kinds of technical difficulties, the USSR set about exploring that immense cornucopia, Siberia. At that time, proven gas reserves were of the order of 1,800 billion m³. Five years later they had already reached 9,800 billion m³ and by 1980 the figure had risen to 21,000 billion m³ or more than two-thirds of Soviet reserves. In all probability, therefore, the USSR possesses sup-

Siberian gas for Europe

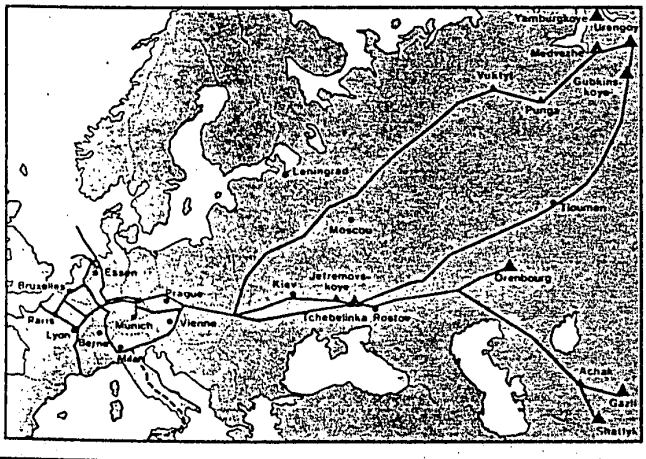
Better known in the West under the name "Russia No. 6", this pipeline construction project now in progress is intended to supply western Europe with at least 40 billion m³ of additional natural gas per year. As things stand at present, West Germany is scheduled to receive from 1984 on 10.5 billion m³ per year (plus, possibly, another 0.7 billion m³ intended exclusively for West Berlin), France 8 billion m³, Italy 6-7 billion m³, the Netherlands and Belgium 5 billion m³ each, Austria 3 billion m³, while Switzerland will probably require only 1 billion m³. Latest estimates of the overall cost of the project are about US$ 15 billion. The 5,500km-long pipeline will link the gas fields in western Siberia (Urengoy and Medvezhe) with the German-Czech border. It would appear that the USSR has, for technical reasons, chosen to lay two 1.42m-diameter pipes operating at a pressure of 45 bars, rather than a single one operating at 140 bars. The total capacity of the double line is understood to be 50-70 billion m³ per year. This will leave a pipeline capacity of at least 10 billion m³ per year by the end of this decade for supplies to other European countries.

It should be noted that, according to Petrostudies projections, which do not include the new Siberian fields, Soviet natural-gas exports, having reached 58.3 billion m³ in 1981, are likely to level out at 59.8 billion m³ per annum by 1984 before decreasing again after 1994. Added to this will be the flow of Siberian gas, which is likely to make itself felt in two stages. The initial deliveries, from 1984 onwards, which should by 1985 reach half the scheduled annual volume of 40 billion m³, will be followed by a second phase, estimated to begin in 1989, when the pipeline is working at full capacity. In other words, the USSR will come close to doubling its natural-gas production capacity between now and the end of the 1980s.

Supplies of Soviet natural gas to western Europe in 1990
as a percentage of total natural-gas supplies and overall energy supplies

	CIA estimates		EEC estimates	
	Natural gas	Energy	Natural gas	Energy
West Germany	29%	6%	34%	7%
France	23–28%	4%	26%	4%
Italy	29%	5%	35%	6%
Netherlands	10%	4%	11%	4%
Belgium	32%	8%	38%	9.5%
Austria	82%	18%	—	—

Map: courtesy of Ruhrgas / Gaz de France



According to figures published by the Defense Intelligence Agency, Soviet natural-gas exports brought in $2 billion in 1978 (equivalent to 4.1% of the country's exports), $2.82 billion in 1979 and $4.98 billion in 1980 (7.4% of exports). During the same period, oil exports, which peaked at 3.16 million barrels per day in 1978, have declined markedly, particularly those to non-communist countries. This explains the lively interest being shown by the USSR in Siberian gas.

It is worth noting here that it was not until 1980 that annual revenues from sales of gas to West European countries ($2,514 billion) overtook those from gas deliveries to COMECON states ($2,471 billion dollars), the respective volumes being 22.65 and 32.28 billion m³. The explanation to this apparent paradox lies in the different pricing policies adopted by the western Europe. For each 28,300m³ (1,000ft³) of gas, the Western countries paid an average of $3.14, compared with $2.70 paid by the USSR's communist brothers, who thus clearly benefited from special sales conditions. In 1980, furthermore, East Germany paid $481 million and Italy $691 million for the same quantity of Soviet gas.

The "Russia No. 6" project will, as can be clearly seen, play a major role in supplying a large number of countries with energy. Although President Reagan, driven more by internal-political motives than any other, threatened on December 29, 1981, not to supply the Soviet Union with some of the 1.42m-diameter pipes it needs to complete the trans-Siberian pipeline, this embargo could very well be an illusory one (the measure would in fact only affect Caterpillar which, if it could not successfully complete scheduled deliveries of pipelaying equipment, would be forced to lay off large numbers of personnel and, to a lesser extent, General Electric which has a contract to supply compressor turbines). In the first place, it would appear that Canada could take over responsibility for the contracts. Secondly, it is difficult to believe that the Europeans will actually revoke the signed agreements.

Certain contracts have, in fact, already been awarded by the Soviet Union — notably those for the purchase of 41 gas compression stations, 22 of which are to be supplied by the Mannesman group (West Germany) and Creusot-Loire (France), the remainder coming from Nuovo Pignone (Italy). Mannesman has already chosen AEG-Kanis as sub-contractor, while Creusot-Loire seems likely to select Alsthom-Atlantique. It would appear, moreover, that data-processing equipment worth nearly FFr2,000 million has been ordered from the French firm Thomson-CSF. The values of the contracts for Mannesman and Creusot-Loire total $1,400 million, while the Nuovo Pignone equipment order is worth $1,100 million. In addition, the Scottish firm John Brown has a contract for £104 million to supply 21 turbines, each rated at 26,000kW (35,000hp).

At the moment, the Soviet Union is negotiating with several West European countries (including West Germany, France, Belgium, Italy and the Netherlands) for the delivery of equipment from 1984 onwards. Provisional agreements have been signed with ENI (Italy) and Ruhrgas (West Germany). In the second half of January 1982, there was a meeting between a delegation from Gaz de France and its counterpart from Soyuzgazexport, but as we went to press it was not yet known whether any signed agreement resulted.

In spite of President Reagan's threats, it seems that it will be difficult to stop a process which has all the appearances of being irreversible. There are those, it is true, who are disquieted — or perhaps prudent — enough to worry about the level of dependence on Soviet natural gas (see table) which this new contract would entail for the countries of the West. (Following the recent declaration of martial law in Poland, Italy, for one, has threatened to suspend negotiations with the Soviets.) But, in the absence of a technological breakthrough during the next few years — something which does not appear to be on the cards at present — western Europe, with the exception of the UK, will remain heavily dependent on other countries for supplies of energy. In these circumstances, it might perhaps be better for western Europe to accept the situation as it is.

plies which should give it economic self-sufficiency up to about the year 2050, even allowing for regular growth of production and consumption. (By way of comparison, North Sea natural gas reserves amount to thirty times less.)

Production

In 1956, having previously formed part of the oil industry, the gas sector in the USSR became independent and even acquired its own ministry. Moreover the marked output increases over the last 25 years are indicative of the role accorded to gas as a substitute for oil — having stood at roughly 7.5 billion m³ from 1955 to 1960, the annual increase rose to 15 billion m³ during the following decade to reach 26.5 billion m³ per year between 1970 and 1980. Annual production increased ten-fold during the period 1960 to 1980 (from 45.3 to 435 billion m³), a markedly higher growth rate than the world average. And in spite of a slight slowing down, the likelihood is that 600 billion m³ will be produced in 1990.

A careful examination of this trend also reveals a rather troubling feature, namely that the gas industry's period of renewed growth began in 1973, the date of the first oil crisis. Merely a coincidence? Perhaps, but at the very least it calls for a number of comments. The tripling of the price of oil at that time was far from being a purely spontaneous affair. Although aimed ostensibly at the United States (the embargo which followed provided sufficient confirmation of that), this threatening move presented an even greater danger to the industries of Europe and Japan whose primary energy resources were practically non-existent. And furthermore the whole world was caught up in a period of crisis. A steady weakening of Europe has always been one of the Soviet Union's more or less veiled objectives and it is hardly surprising that certain kremlinologists have seen the shadow of Moscow lurking behind the 1973 crisis. If this was the case, natural gas would then have played its part as a political weapon for the first time.

Exports

Exports are of course the key factor in the USSR's natural-gas policy and the Kremlin leadership must have paid very special attention to this aspect of the question. Moreover it has to be recognized that their efforts were well rewarded: between 1975 and 1979, output rose by 41%, domestic consumption by 30% and exports by 135%, while imports declined by 75%.

Up to 1967, the only countries to benefit from supplies of Russian gas — all of it from the Ukraine — were a few members of COMECON such as Czechoslovakia and Poland. It was not until 1979 that a large-scale gas pipeline (diameter 1.42m) financed and built jointly by the USSR and its satellites entered service. This pipeline starts at Orenburg in the Urals and has an average annual capacity of some 30 billion m³, its main purpose being to supply the countries of the Eastern Bloc. The significance of the project, which is designated "Soyuz", can be gauged from the fact that the North Sea gas pipelines have a maximum capacity of between 15 and 22 billion m³ per year.

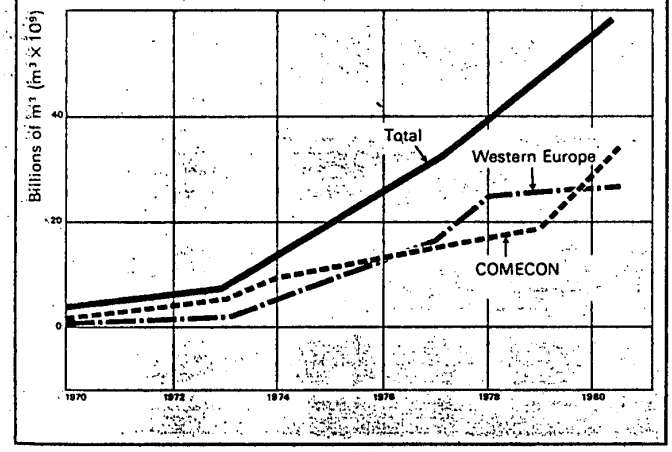
As for the countries of western Europe, natural gas is becoming an increasingly crucial necessity for them from year to year. At present, these countries are linked to the oilfields of the Ukraine and in particular to the one at Shebelinka, although production there is declining markedly. A gas pipeline running 5,500km from Medvezhe (western Siberia) to the Czech frontier should enter service in 1984. The volume of Soviet supplies — indispendable to Europe — will then be close on 100 billion m³ per year.

The first commercial links were established with Austria in 1968, West Germany and Italy not following until 1975 and France in 1976. By 1980 France was spending the equivalent of FFr13 billion on Soviet oil and natural gas (4 billion m³), although even this is only half as much as the quantities imported by West Germany (9 billion m³) and Italy (7 billion m³).

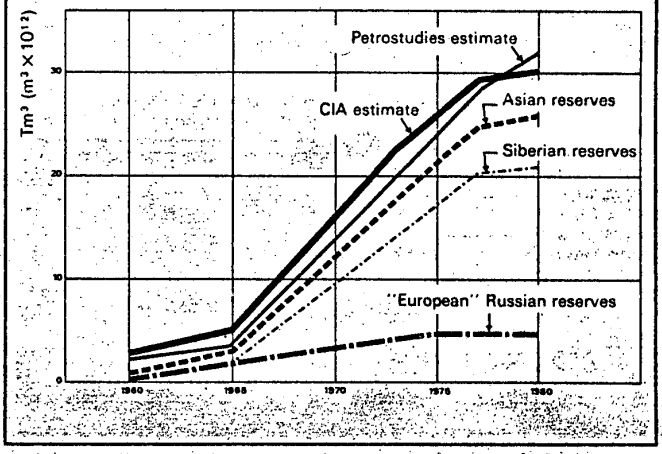
From 1975 to 1978 it was imports by Western countries that set the pace. But after that the trend was reversed and the COMECON countries began to receive preferential treatment from the USSR in respect of natural-gas exports. There are several possible explanations for this:

1. From 1976 onwards signs of latent discontent have become apparent in the Eastern Bloc countries. Faced with this situation, the Kremlin leadership has begun to see a special need to tighten Soviet "links" with the European satellites while at the same time trying to reduce their debt with Western banks. With the Soviet Union's oil surplus diminishing visibly and in all probability being reserved mainly

Soviet exports of natural gas



Proven gas reserves in the USSR



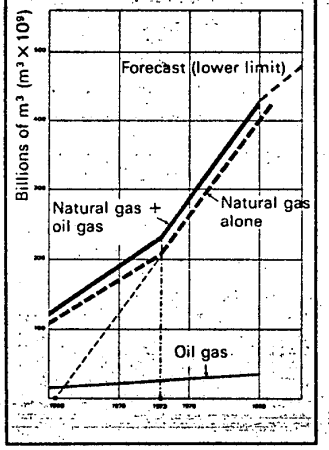
▲ *Natural-gas exports, a trump card for the Soviet economy, began flowing in earnest in 1973. The change of policy which evidently took place in 1978 reveals the dilemma confronting the USSR: to maintain her pressure on the COMECON countries with the aid of this new weapon or to obtain hard currency and equipment from western Europe. The Russians will have to show considerable political skill in this field not to be seen to be favouring one of these markets too overtly by comparison with the other.*

▶▲ *CIA estimates and analyses by the Swedish consultancy firm Petrostudies for 1978-90 do not differ seriously — as they do in the case of oil — when it comes to Soviet reserves of natural gas. Even at the present stage of exploration, Soviet gas reserves already amount to over 30,000 billion m³ or the equivalent of a good sixty years' production at the 1980 rate of extraction.*

▶ *The prospects for natural-gas exploitation in the Soviet Union have looked good ever since 1973, the year of the first oil crisis. Twenty-five new deposits have been found during the last three years and the giant deposit at Dauletabad (Turkmenistan) was discovered in 1974. Output doubled between 1970 and 1979 and targets have been surpassed in all the regions. Between 1976 and 1979 the USSR invested 17 billion roubles (over $20 billion) in this industry and laid 24,000km of gas pipelines, enabling an annual growth rate of 9% to be achieved. The aim of the current five-year plan is even more ambitious, envisaging a rise from 435 billion m³ in 1980 to 650 billion in 1985 — an increase of almost 50% in five years. However, the first confirmed results for 1980 (422 billion m³) and for the first nine months of 1981 (342 billion m³, equivalent to an annual figure of 456 billion m³) already put the level of production roughly 5% below the least optimistic projected figure.*

Soviet production of natural gas

(Source: Petrostudies)



for military purposes, natural gas has put in a very timely appearance as far as straightening out COMECON's energy policy is concerned.

2. Although still inadequate, systematic efforts to save energy in western Europe were beginning to pay off and were generally turning out to be more effective than most people admitted.

3. November 1977 saw the appearance on the market of the first substantial and regular deliveries of natural gas (especially LNG) from the North Sea.

These three factors may not be the only ones involved, but they suffice on their own to explain the change of trend.

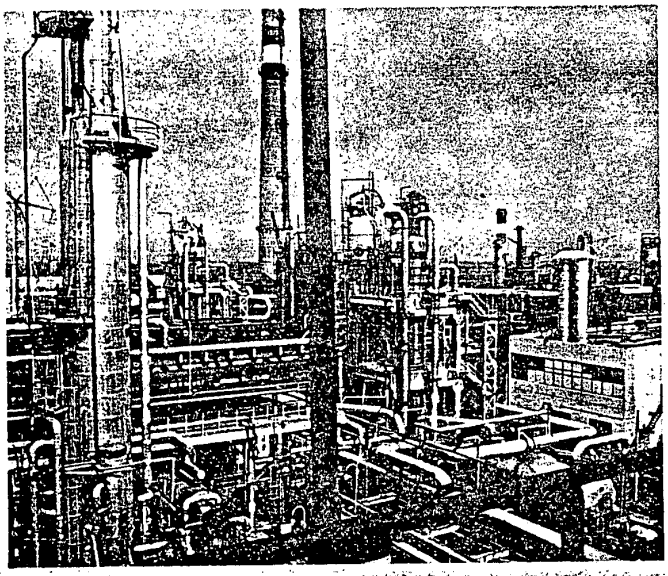
The other side of the coin

Soviet natural gas clearly has potential, but extracting it is by no means a mere formality. In the first place, the problem facing the Moscow leadership is made very much more difficult by the fact that prospecting and production must take place largely in the eastern part of the country. While over four-fifths of the proven reserves are situated in Siberia and the extreme East of the USSR, 80% of consumption occurs – for obvious reasons – in the western regions. Nor are matters simplified by the geographical dispersion of these resources over a vast territory twenty times the size of France. Moreover as the USSR has no gas liquefaction plants, production depends upon the pipelines operating properly. These, however, are subject to the very considerable differences between day and night temperatures and are exposed to the snow-storms of Siberia and sandstorms of Turkmenistan. Frequent floods caused by the big Siberian rivers such as the Ob and Irtysh make them hard of access during much of the year. For the most part, new sections can only be laid during the winter.

In addition, deliveries of equipment, which are generally incomplete and irregular, can be delayed for long periods and this has a very bad effect on the quality of the work (welding, insulation, etc). When of Soviet origin, the materials themselves are only rarely of the quality needed for applications of this kind. The infrastructure lags behind the prospecting program and the whole process is hampered by notorious organizational shortcomings. Railways, roads, river ports, living quarters, power supplies, etc, are still very inadequate. Moreover it has not always been possible to release the necessary funds (the Baikal-Amur section, for example, has not yet been completed as called for in the previous five-year plan).

Total dependence on pipelines for supplies continues to be a major handicap. For instance, the network of large-volume gas pipelines (1.22-1.42m diameter) is already experiencing serious setbacks although constructed roughly five years after its oil counterpart. This explains why in 1979 supplies to western Europe, although traditionally dependent upon the fields in western Siberia and the Ukraine, were taken from the Orenburg deposit. This natural gas has a sulphur content of 5%, which would be nothing compared with the roughly 15% at Lacq if the desulphurization plant at Orenburg – although of French design – were not prone to perpetual breakdowns. As a result, Western consumers experienced daily drops of up to 40% in supplies during the period in question and also had to put up with the strongly sulphurous smell of the gas they did receive. Furthermore, the presence of H_2S can lead to a fair amount of corrosion, the effects of which have been particularly marked in the Orenburg-Zainsk section. This problem is in fact so worrying that the Europeans are considering the possibility of building two additional desulphurization plants, one at Waidhaus (German-Czech border) and the other at Baumgarten (Austrian-Czech border). This clearly shows their interest in future supplies of Soviet gas.

▼ *Partial view of the 3rd section of the Tekhmashimport desulphurization plant at Orenburg (USSR). Designed by the French company Technip and completed in 1978, this complex has a treatment capacity of 50 billion m³ per year, which makes it the world's biggest gas treatment unit.*



How things stand

The USSR's natural-gas industry has experienced a remarkable boom, particularly during the period of the 10th five-year plan, as can be seen from certain key figures. Pipe manufacture for the gas industry is at present running at double the level of production for the oil sector. Investment in the oil industry has risen from 2 to 6 billion roubles – i.e. tripled – in 15 years. The increase in investment in the natural-gas industry has been a seven-fold one over the same period and investment has now reached practically the same volume as with oil. In 1978-1979 alone it apparently doubled, whereas credits granted to the oil industry increased by no more than 20% during the same timespan. However, this is due partly to the massive rise in the cost of constructing the pipelines and to getting the first Siberian fields into production.

On the other hand – and this has become even more clear since 1973 – these new resources have given the Russians an important political weapon. One example of what this could mean was seen not long ago in Poland during Mr Gromyko's most recent visit to Warsaw. Certainly, the main step taken by the Soviet side was to renew officially the clauses relating to "mutual assistance" by Poland and the USSR (a declaration of this sort, of course, preceded the invasions of Hungary, Czechoslovakia and Afghanistan). But the threat to stop supplying natural gas to Poland – which enjoys special advantages in this field – was just as important.

For Europe the situation is slightly different. Although up to the present time commercial relations have been based essentially on an exchange of gas for pipes, this type of operation could well become problematical before very long.

The export of petroleum products to Western countries could provide the USSR with an estimated annual market of over $17 billion, which is equivalent to what Libya earns from her oil. It would be well to recall that in a speech before Congress last April General Haig was insistent about the considerable sums which he claimed the USSR was spending to maintain or provoke hotbeds of unrest throughout the Third World. Seen in this context, natural gas has every semblance of becoming a new pressure point in time of tension, particularly when we also consider the "pacifist" movements which are increasingly active in central Europe – and especially West Germany – and are known beyond any doubt to be financed partly by the KGB.

Conclusions

When President Reagan lifted the grain embargo against the USSR last April, it demonstrated quite clearly that such measures are illusory if taken by a single country, however powerful, in the context of a capitalist system, characterized as it is by free competition and overproduction. This was something that the farmers of the Mid-West, for their part, certainly understood very well. In view of the world distribution of primary energy and the present lack of stability of the market, on the other hand, we cannot rule out *a priori* the possibility that pressure may be brought to bear simultaneously by the OPEC countries and the USSR.

The problem can also be formulated in other terms. The European countries in fact scarcely have any choice, dependent as they are on outside sources for nearly 50% of their energy needs. So the question arises as to whether they would prefer to depend for over 30% of their supplies on countries like Iran and Saudi Arabia or to rely on the Soviet Union for 6% of their natural gas. Moreover the 15 billion dollars invested in the trans-Siberian gas pipeline mean an impressive amount of work for a Europe which can no longer afford to ignore its ten million unemployed.

In view of the size and ambitions of the USSR it would be wrong to underrate either the political or the economic consequences of the contracts signed by Ruhrgas or of those which are likely to follow in their wake. But Europe has the technological ability to provide itself with safeguards. It would certainly be sensible for Europe to think about these things while time is still available and to ensure now that she has the means of countering any future blackmail.

In addition, it should be noted that the energy requirements of the Third World will undoubtedly pose a crucial problem in the near future. Although by the year 2020 these countries are likely to account for over 80% of the world's population, their proven energy reserves at present amount to no more than 15%. By that date their requirements will have increased more than six-fold and will be twice as high as the energy consumption of all the industrialized countries together.

The Soviet Union for her part has not forgotten the essential facts. Those in possession of oil will be able to a large extent to control the military situation; those with natural gas could well hold one of the keys to the Third World of tomorrow. The USSR has both. We might leave the final word on this matter to an article published by our German colleagues from the journal OEL: "You can always trust the Russians in matters of business. In this case they'll either send us their natural gas...or else come themselves." ✦✦